

What is claimed is:

1. ~~A method of correcting the color of a print medium,~~  
comprising the steps of:

5        converting device-dependent image data to first  
colorimetric data with color converting means given to a  
standard print medium;

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10        thereafter, converting said first colorimetric data to  
second colorimetric data with color correcting means to  
correct the difference between the color of a desired print  
medium and the color of said standard print medium; and

15        producing a proof on which the difference between the  
color of said desired print medium and the color of said  
standard print medium has been corrected, on a proof medium  
with an image output device based on said second  
colorimetric data;

20        wherein said color correcting means comprises one-  
dimensional lookup tables for converting said first  
colorimetric data to said second colorimetric data.

2.       A method of correcting the color of a print medium,  
comprising the steps of:

25        converting device-dependent image data, which have been  
converted in gradation with respect to each color in order  
to match desired printing conditions by gradation converting  
means, to first colorimetric data with color converting  
means corresponding to standard printing conditions given to

a standard print medium;

thereafter, converting said first colorimetric data to second colorimetric data with color correcting means to correct the difference between the color of a desired print medium and the color of said standard print medium; and

producing a proof on which the difference between the color of said desired print medium and the color of said standard print medium has been corrected, on a proof medium with an image output device based on said second colorimetric data.

3. A method according to claim 1, wherein said color correcting means is generated by outputting color patches, whose colorimetric values are varied in a colorimetric color space about the color of the standard print medium, with said image output device, and comparing the color of the desired print medium with the colors of the color patches on the proof medium.

4. A method according to claim 2, wherein said color correcting means is generated by outputting color patches, whose colorimetric values are varied in a colorimetric color space about the color of the standard print medium, with said image output device, and comparing the color of the desired print medium with the colors of the color patches on the proof medium.

5. A method according to claim 3, wherein said color patches outputted on said proof medium comprise color patches whose colorimetric values  $L^*a^*b^*$  are varied in a CIELAB color space about the color of said standard print medium.

6. A method according to claim 4, wherein said color patches outputted on said proof medium comprise color patches whose colorimetric values  $L^*a^*b^*$  are varied in a CIELAB color space about the color of said standard print medium.

7. An apparatus for correcting the color of a print medium, comprising:

color converting means given to a standard print medium, for converting device-dependent image data to first colorimetric data;

color correcting means for converting said first colorimetric data to second colorimetric data to correct the difference between the color of a desired print medium and the color of said standard print medium; and

an image output device for producing a proof on which the difference between the color of said desired print medium and the color of said standard print medium has been corrected, on a proof medium based on said second colorimetric data;

wherein said color correcting means comprises one-

~~dimensional lookup tables for converting said first colorimetric data to said second colorimetric data.~~

5 8. An apparatus for correcting the color of a print medium, comprising:

gradation converting means for converting the gradation of device-dependent image data with respect to each color in order to match desired printing conditions;

color converting means corresponding to standard printing conditions given to a standard print medium, for converting the gradation-converted device-dependent image data to first colorimetric data;

color correcting means for converting said first colorimetric data to second colorimetric data to correct the difference between the color of a desired print medium and the color of said standard print medium; and

an image output device for producing a proof on which the difference between the color of said desired print medium and the color of said standard print medium has been corrected, on a proof medium based on said second colorimetric data.

25 9. An apparatus according to claim 7, wherein said color correcting means is generated by outputting color patches, whose colorimetric values are varied in a colorimetric color space about the color of the standard print medium, with said image output device, and comparing

~~the color of the desired print medium with the colors of the color patches on the proof medium.~~

5      10. An apparatus according to claim 8, wherein said color correcting means is generated by outputting color patches, whose colorimetric values are varied in a colorimetric color space about the color of the standard print medium, with said image output device, and comparing the color of the desired print medium with the colors of the color patches on the proof medium.

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15      11. An apparatus according to claim 9, wherein said color patches outputted on said proof medium comprise color patches whose colorimetric values  $L^*a^*b^*$  are varied in a CIELAB color space about the color of said standard print medium.

20      12. An apparatus according to claim 10, wherein said color patches outputted on said proof medium comprise color patches whose colorimetric values  $L^*a^*b^*$  are varied in a CIELAB color space about the color of said standard print medium.

25      13. A proofer for generating a color proof on a proof print medium having color different from the color of a desired print medium, wherein said proofer has a color adjusting function for adjusting the difference between the

~~color of said desired print medium and the color of a~~  
standard print medium;

wherein said color adjusting function comprises one-  
dimensional lookup tables for converting the color of a  
standard print medium to the color of said desired print  
medium.

14. A proofer according to claim 13, wherein said  
proofer outputs said proof medium having color patches whose  
colors are varied, and said color adjusting function adjusts  
color by visually comparing the color of said desired print  
medium with the colors of said color patches on said proof  
medium.

15. A proofer according to claim 13, wherein said  
color adjusting function adjusts color by using a  
colorimetric data which is determined by colorimetrically  
measuring the color of said desired print medium with a  
colorimetric.

16. A proofer according to claim 13, further  
comprising a printing profile, wherein said color adjusting  
function adjusts color by a color converting means behind  
said printing profile.

17. A proofer according to claim 13, further  
comprising a synthetic color converting means at least

~~combining a printing profile, a color converter for  
adjusting color, and a printer profile, for correcting color.~~

5 18. A method of correcting the color of a print medium,  
comprising the steps of:

converting device-dependent image data to first  
colorimetric data with color converting means given to a  
standard print medium;

thereafter, converting said first colorimetric data to  
second colorimetric data with color correcting means to  
correct the difference between the color of a desired print  
medium and the color of said standard print medium; and

producing a proof on which the difference between the  
color of said desired print medium and the color of said  
standard print medium has been corrected, on a proof medium  
with an image output device based on said second  
colorimetric data;

wherein the color correcting means corrects the data  
based on the ratios of  $X\alpha/X0$ ,  $Y\alpha/Y0$  and  $Z\alpha/Z0$ , where  $X\alpha$ ,  $Y\alpha$   
and  $Z\alpha$  are second colorimetric data values and  $X0$ ,  $Y0$  and  
 $Z0$  are first colorimetric data values for which the  
difference between the color of a desired print medium and  
the color of said standard print medium has been corrected.

25 19. A method according to claim 18, wherein said color  
correcting means is generated by outputting color patches,  
whose colorimetric values are varied in a colorimetric color

~~space about the color of the standard print medium, with~~  
said image output device, and comparing the color of the  
desired print medium with the colors of the color patches on  
the proof medium.

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20. A method according to claim 19, wherein said color  
patches outputted on said proof medium comprise color  
patches whose colorimetric values  $L^*a^*b^*$  are varied in a  
CIELAB color space about the color of said standard print  
medium.

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21. An apparatus for correcting the color of a print  
medium, comprising:

color converting means given to a standard print medium,  
for converting device-dependent image data to first  
colorimetric data;

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color correcting means for converting said first  
colorimetric data to second colorimetric data to correct the  
difference between the color of a desired print medium and  
the color of said standard print medium; and

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an image output device for producing a proof on which  
the difference between the color of said desired print  
medium and the color of said standard print medium has been  
corrected, on a proof medium based on said second  
colorimetric data;

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wherein the color correcting means corrects the data  
based on the ratios of  $X_a/X_0$ ,  $Y_a/Y_0$  and  $Z_a/Z_0$ , where  $X_a$ ,  $Y_a$



~~and  $Z\alpha$  are second colorimetric data values and  $X0$ ,  $Y0$  and  $Z0$  are first colorimetric data values for which the difference between the color of a desired print medium and the color of said standard print medium has been corrected.~~

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22. An apparatus according to claim 21, wherein said color correcting means is generated by outputting color patches, whose colorimetric values are varied in a colorimetric color space about the color of the standard print medium, with said image output device, and comparing the color of the desired print medium with the colors of the color patches on the proof medium.

23. An apparatus according to claim 22, wherein said color patches outputted on said proof medium comprise color patches whose colorimetric values  $L^*a^*b^*$  are varied in a CIELAB color space about the color of said standard print medium.

24. A proofer for generating a color proof on a proof print medium having color different from the color of a desired print medium, wherein said proofer has a color adjusting function for adjusting the difference between the color of said desired print medium and the color of a standard print medium;

wherein the color adjusting function adjusts color proof data based on the ratios of  $X\alpha/X0$ ,  $Y\alpha/Y0$  and  $Z\alpha/Z0$ ,

where  $X\alpha$ ,  $Y\alpha$  and  $Z\alpha$  are colorimetric data values for producing a proper color on said desired print medium and  $X0$ ,  $Y0$  and  $Z0$  are colorimetric data values producing the proper color on said standard print medium.

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25. A proofer according to claim 24, wherein said proofer outputs said proof medium having color patches whose colors are varied, and said color adjusting function adjusts color by visually comparing the color of said desired print medium with the colors of said color patches on said proof medium.

26. A proofer according to claim 24, wherein said color adjusting function adjusts color by using a colorimetric data which is determined by colorimetrically measuring the color of said desired print medium with a colorimeter.

27. A proofer according to claim 24, further comprising a printing profile, wherein said color adjusting function adjusts color by a color converting means behind said printing profile.

28. A proofer according to claim 24, further comprising a synthetic color converting means at least combining a printing profile, a color converter for adjusting color, and a printer profile, for correcting color.

29. The method of claim 3, wherein a color of a central color patch is the same as a color of the standard print medium.

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30. The method of claim 29, wherein the color patches comprise three-dimensional colorimetric values of  $L^*a^*b^*$  and color patches are arranged as  $a^*-b^*$  planes in respective cross sections of different  $L^*$ -axes values.

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31. The method of claim 30, wherein each color patch is assigned an integer as a relative position from the central color patch according to each axis of  $L^*a^*b^*$  for showing increment/decrement intervals of a colorimetric value and the color of the desired print medium is compared with the color patches, and wherein when no color patch is the same as the color of the desired print medium, a value between two closest color patches which is close to the color of the desired print medium is described as a real number to describe a colorimetric value of the desired print medium.

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32. The method of claim 31, wherein a color difference  $\Delta E$  in adjacent color patches on each axis of  $L^*a^*b^*$  has value between 1.5 and 2.0, inclusive.

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33. The method of claim 4, wherein a color of a

~~central color patch is the same as a color of the standard  
print medium.~~

5        34. The method of claim 33, wherein the color patches  
comprise three-dimensional colorimetric values of  $L^*a^*b^*$  and  
color patches are arranged as  $a^*-b^*$  planes in respective  
cross sections of different  $L^*$ -axes values.

10       35. The method of claim 34, wherein each color patch  
is assigned an integer as a relative position from the  
central color patch according to each axis of  $L^*a^*b^*$  for  
showing increment/decrement intervals of a colorimetric  
value and the color of the desired print medium is compared  
with the color patches, and wherein when no color patch is  
15       the same as the color of the desired print medium, a value  
between two closest color patches which is close to the  
color of the desired print medium is described as a real  
number to describe a colorimetric value of the desired print  
medium.

20       36. The method of claim 35, wherein a color difference  
 $\Delta E$  in adjacent color patches on each axis of  $L^*a^*b^*$  has  
value between 1.5 and 2.0, inclusive.

25       37. The method of claim 9, wherein a color of a  
central color patch is the same as a color of the standard  
print medium.

5      ~~38. The method of claim 37, wherein the color patches~~  
comprise three-dimensional colorimetric values of  $L^*a^*b^*$  and  
color patches are arranged as  $a^*-b^*$  planes in respective  
cross sections of different  $L^*$ -axes values.

10      39. The method of claim 38, wherein each color patch  
is assigned an integer as a relative position from the  
central color patch according to each axis of  $L^*a^*b^*$  for  
showing increment/decrement intervals of a colorimetric  
value and the color of the desired print medium is compared  
with the color patches, and wherein when no color patch is  
the same as the color of the desired print medium, a value  
between two closest color patches which is close to the  
color of the desired print medium is described as a real  
number to describe a colorimetric value of the desired print  
medium.

15      40. The method of claim 39, wherein a color difference  
20       $\Delta E$  in adjacent color patches on each axis of  $L^*a^*b^*$  has  
value between 1.5 and 2.0, inclusive.

25      41. The method of claim 10, wherein a color of a  
central color patch is the same as a color of the standard  
print medium.

42. The method of claim 41, wherein the color patches

comprise three-dimensional colorimetric values of  $L^*a^*b^*$  and color patches are arranged as  $a^*-b^*$  planes in respective cross sections of different  $L^*$ -axes values.

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43. The method of claim 42, wherein each color patch is assigned an integer as a relative position from the central color patch according to each axis of  $L^*a^*b^*$  for showing increment/decrement intervals of a colorimetric value and the color of the desired print medium is compared with the color patches, and wherein when no color patch is the same as the color of the desired print medium, a value between two closest color patches which is close to the color of the desired print medium is described as a real number to describe a colorimetric value of the desired print medium.

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44. The method of claim 43, wherein a color difference  $\Delta E$  in adjacent color patches on each axis of  $L^*a^*b^*$  has value between 1.5 and 2.0, inclusive.